

When I observed the deepest sensible Red, and deepest sensible Violet, (the corrected distance of which Colours when all things were ordered to the best advantage, and the Sun shone very clear, was about $\frac{11}{12}$ or $\frac{15}{16}$ parts of the length of the rectilinear sides of the coloured Spectrum,) I found the difference of the distances of their Foci from the Lens sometimes $4\frac{3}{4}$ sometimes $5\frac{1}{4}$, and for the most part 5 Inches or thereabouts: and as 11 to 12 or 15 to 26, so is five Inches to $5\frac{1}{2}$ or $5\frac{2}{3}$ Inches.

And by this progression of Experiments I satisfied myself, that had the light at the very Ends of the Spectrum been strong enough to make the Species of the black Lines appear plainly on the Paper, the Focus of the deepest Violet would have been found nearer to the Lens, than the Focus of the deepest Red, by about $5\frac{1}{3}$ Inches at least. And this is a further Evidence, that the Sines of Incidence and Refraction of the several sorts of Rays, hold the same proportion to one another in the smallest Refractions which they do in the greatest.

My progress in making this nice and troublesome Experiment I have set down more at large, that they that shall try it after me may be aware of the Circumspection requisite to make it succeed well. And if they cannot make it succeed so well as I did, they may notwithstanding collect by the Proportion of the distance of the Colours in the Spectrum, to the difference of the distances of their Foci from the Lens, what would be the success in the more distant Colours by a better Trial. And yet if they use a broader Lens than I did, and fix it to a long straight Staff by means of which it may be readily and truly directed to the Colour whose Focus is desired, I question not but the Experiment will succeed better with them than it did with me. For I directed the Axis as nearly as I could to the middle

middle of the Coloured Spectrum being rendered distinctly on the Paper. The Axis been successive.

Now by what I have said, it is manifest, that the Rays which differ in refrangibility, have different Focus, but if they be directed to the same Focus of the most refrangible Ray, the Focus of the most refrangible Ray is less than that of the least refrangible Ray, by the twentieth part of the whole distance. And if the Rays be directed to the Focus of the least refrangible Ray, they will illuminate within a Circle in the middle of the Spectrum, perpendicular to the Axis of the Lens, they can all be gathered into the Focus of the least refrangible Ray, by the diameter of the aperture of the Lens, that Telescopes represent. And if all the Rays were all the Rays arising only from the Focus of the least refrangible Ray, would be many hundred times as great as the Focus of a Telescope be turned towards the Focus of the least refrangible Ray, whereof this is the Semidiameter of the Lens, the Sine of Incidence, Refraction as I to the Focus of the least refrangible Ray, Object is most distant.